Volume 1

PM PERSPECTIVES

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A look back at PM Challenge 2005, A look ahead to Putting New Ideas Into Action

May 2005

From the PM Challenge Co-Chairs:

Along with our conference committee, we were thrilled to host PM Challenge 2005. Based on your feedback, the second annual NASA Project Management Conference was a great success, and continued to provide a forum for "One NASA" to focus on the importance of project management to mission success. PM Perspectives takes a look back at some of the highlights from the conference. The articles in this magazine were written by our student volunteers from George Washington University and the University of Maryland and offer insight into some of the important topics, lessons, and ideas presented at the conference. All of the PM Challenge 2005 presentations can be found at: http://pmchallenge.gsfc.nasa.gov/presentations2005.htm

We would like to say a special thank you to Jeff Jones, Jennifer Poston and Judy Rumerman for their efforts in making this edition of PM Perspectives possible.

Enjoy reading this issue of PM Perspectives, and pass it along to your colleagues.

Dorothy Tiffany,
Walt Majerowicz

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PM Challenge 2005

By Judy Rumerman, JR Publications

More than 800 people gathered at the Conference Center on the University of Maryland College Park campus for NASA's Project Management Challenge 2005, a two-day conference filled with speakers, panels, and exhibitors featuring some of the best ideas and products relating to project management. This conference brought to the forefront the evolving discipline of project management and the group of people who are as vital to mission success as are NASA's talented scientists and engineers—project managers and practitioners, the individuals who pull it all together and make NASA's extraordinary achievements possible.

The conference featured 125 speakers from NASA and other government agencies, from private industry, and from academia, who engaged their audiences with innovative and forward-thinking ideas. Eleven tracks of small-group discussions and panels interacted with more intimate groups, allowing animated debate among the speakers and between the speakers and audience. Thirty-seven exhibitors displayed and demonstrated their products while making useful contacts. Making it all possible were fifty committee members who handled the logistics, registration, and materials and who so ably kept the tracks running smoothly.

With 800 people attending, the atmosphere outside the sessions was decidedly social. At the luncheons and evening reception, around the snack tables and exhibitors' displays, colleagues who had not seen each other for years greeted each other and new acquaintances were made. Attendees came from all the NASA centers, many industry partners were represented, and students and faculty from academia all attended.

Among this year's attendees were a special group of graduate students from The George Washington University, whose attendance was sponsored by Perot Systems, and undergraduates from the University of Maryland, who were sponsored by the Maryland Space Business Roundtable. These master's candidates in project management and undergraduates in engineering attended as many of the sessions as they could fit into their busy days and wrote short articles summarizing what they learned. This magazine includes their contributions.

This magazine is aimed at those who attended this year's conference. It hopes to refresh their memories about their experiences there. It also hopes to interest those who missed this year's conference into making it a priority on next year's calendar, when it will take place in Galveston, Texas.

What's the Big Idea?

By Natalya Hicks

Mr. Larry Prusak, introduced as an authority on knowledge management, presented the keynote speech titled "What's the Big Idea?--Creating and Capitalizing on the Best Management Thinking." Mr. Prusak began his discussion about ideas with the theory that firms, agencies, and countries don't have a chance for survival if they don't incorporate ideas. He gave the example of Westinghouse and General Electric. Westinghouse was started by engineers and accountants who considered everything measurable. No professors were brought in to assist the company, and managers were not interested in ideas. General Electric, on the other hand, played with ideas and invested time and money in them. Today, Westinghouse no longer exists, and General Electric is the second richest company in the United States.

What's the Big Idea?, Mr. Prusak's book, looks at where management and business ideas originate. He suggests that about 300 of these types of ideas have been proposed since World War II, such as benchmarking and brand management. He describes these ideas as sweeping over organizations like tsunamis. Demand for these ideas is driven by the fact that management is an art, not a science. Since it is an art, ideas cannot be disproved. Thus, organizations always face more challenges, socially constructed ideas, and different categories of what is true. The plethora of business and management ideas is also driven by globalization, budgetary pressures, and the nature of constraints on resources. The supply side of these business and management ideas is provided by practitioners, such as consultants, gurus, academics, and heroic managers. All these practitioners use social pressure to push their ideas. They do this by creating a good name or slogan, getting published in a reputable publication such as the *Harvard Business Review*, and getting a consulting firm behind them to sell the idea.

These ideas then go through a "P" Cycle. The "P" Cycle includes: *pilot*, the first step when someone invests in the idea; *program*, when the idea is actually being used and needs to have some demonstrated success; *pervasive*, when the idea is accepted and begins to spread; *perspective*, when everyone is talking about the idea; and *ponder*, when the idea is here to stay. The tipping point of an idea occurs after about two years when the idea is either rejected or accepted. Business process reengineering is an example of an idea that was eventually rejected. Knowledge management, on the other hand, was accepted. Mr. Prusak suggests that you must learn to evaluate new ideas and suggests that this be done by not being the first to use them. By seeing what other organizations have done, and by talking to people who have tried them out directly, you don't have to worry about the theory of the idea as much.

"Idea Practitioners" were also described by Mr. Prusak as people who do "idea work" in organizations. Mr. Prusak's research has shown that the same people came up with many ideas for large organizations; he has classified them as "idea practitioners." Over 100 of these types of employees were identified and interviewed, and it is theorized that they make up four to six percent of large organizations. The idea practitioners interviewed were found to occur in the same percentages across genders, have been with the same organization for 10 to 20 years, be in upper-middle and lower-upper senior management positions, have created a strong and durable network, be sociable and liked by other people, and to read widely. Approximately 95 percent of them were graduates of the arts. These idea practitioners did four things well: 1) fitting an idea to the organization's culture, 2) judging their audience and tailoring their presentation to them, 3) telling stories well, and 4) fighting for their idea.

Mr. Prusak provided an entertaining and informative view of ideas in the realm of management and business. He explained the importance of ideas and the basis of the supply and demand sides of management and business ideas. Mr. Prusak also introduced the concept of idea practitioners in large organizations and how they present new ideas.

Project Success as the Customer Sees It

By Emily Whitted

In this presentation, "Success as the Customer Sees It," Mr. Hugh Woodward of Macquarie Business Concepts challenges the traditional determinants of project success by introducing a new dimension. The new dimension is that project success is not based only on schedule, cost, and scope. Rather, it goes one step further to address the customer's perception of the project. He demonstrates that while the overall goal of a project team is to satisfy the customer, focusing only on the triple constraint of cost, time and scope can yield an outcome that misses the mark for success as the customer sees it.

What determines project success? Traditionally, in the world of project management, a successful project is determined by schedule, cost, and a specified level of performance. This presentation gave several examples of projects in which the true determinant of project success cannot be measured by being "on time, on budget, or within scope." The true determinant of success is far less tangible or even measurable. Success is as the *customer* sees it.

Hugh Woodward began with a quick review of The Sydney Opera House, a landmark of Australia. A major continent and city landmark must surely be an example of project success. Not quite. Based on traditional criteria, the project was a total failure. At project end, the Sydney Opera House had incurred a 1300 percent cost overrun and finished 250 percent over schedule.

Why then was this landmark viewed as a successful project? How can history remember the beauty of the Opera House without judging project performance as a total disaster? This question is quickly answered by asking: "What was the customer's perception of success?" Customer Success = City Image.

Mr. Woodward then took a quick survey of the room. He wanted to know who owned a Kodak Advantix camera. Only three people in the audience owned that camera. Mr. Woodward then asked a second question: who in the room owned a digital camera. Practically everyone in the audience raised their hands, including those who owned the Advantix camera. It should be noted that Mr. Woodward opened his survey with "Now here's a project that was a success. We know it was a success because the Project Management Institute (PMI) said it was a success."

The Advantix camera by Kodak was PMI's 1997 International Project of the Year, coming in on time and under budget. It was also the best new product of 1996, according to *Business Week* magazine. The Advantix was a huge project for Kodak and four other companies for a period of years. Yet not many people own the camera.

What does history recall about the Advantix camera? Not much by way of market-share if we look at the audience as a sample of a larger population. From a corporate perspective, this project failed dismally. Kodak was putting its resources into developing this camera while everyone else was investing in digital cameras. In the five years since the Advantix camera was produced, Kodak stock dropped 67 percent and resulted in a 50 percent reduction of its labor force worldwide. At the time, Rochester, New York, home of Kodak headquarters, had one of the highest unemployment rates in the United States. What was the customer's perspective of project success? Customer success = increased revenue. Was this really a successful project in spite of what the PMI said?

These are just two of several examples that Mr. Woodward used to illustrate his point, which he solidified by statistical data. Reports show that projects are generally

over cost and over budget. While the statistics continue to improve, it still causes one to wonder how we sell project management. In fact, statistics show that when conventional project management criteria are used, *only 28 percent of the time*, based on PMI determinants of project success, will project objectives be achieved. Yet ironically, the study of project management based on PMI's definition of what constitutes good project management continues to grow. PMI members have increased to approximately 105,000 strong, with 73,000 PMP certified.

Project managers, Mr. Woodward claims, are producing something much more valuable than merely meeting schedule and budget estimates. In reality, according to Mr. Woodward, a project ultimately succeeds because the project manager has the ability to think *beyond* the triple constraint of budget, schedule, and scope, really formulating the project's objectives in the customer's terms. This results in enhanced revenue, increased productivity, operating efficiency, and customer satisfaction because, ultimately, project success is as the customer sees it!

Delivery of the Canadian Robotic Arm

By Holly Schurter

Mr. Gerald Maxwell's presentation at Project Management Challenge 2005 dealt with his experiences as NASA MSFC Project Manager for the installation of the Space Station Remote Manipulator System, or SSRMS. He discussed the process that went into deciding how to get the arm from the ground to the space station, as well as his experiences managing the overall project. He closed with some final thoughts on program management and some advice to fellow project managers. His overall message was that the secret to being a good project manager is the ability to get along with everyone, no matter how difficult.

Mr. Maxwell's project, the SSRMS, is essentially a robotic arm, also known as Canadarm2, designed by the Canadian Space Agency for use on and in the assembly of the International Space Station. It was carried to the ISS on board the Space Shuttle *Endeavor*, on STS-100, International Space Station Flight 6A, launched on April 19, 2001. Astronauts Mr. Chris Hadfield of the Canadian Space Agency and Mr. Scott Parazynski of NASA installed the arm during a space walk on April 22.

Mr. Maxwell first explained the unique circumstances that led to his assignment as project manager for this mission. Initially, he was working under the project manager. However, when the original project manager got in an intense argument with the customer, Mr. Maxwell repaired relations and immediately became the replacement PM. Mr. Maxwell successfully dealt with the difficult customer, the team selected by the previous PM, and numerous international and national space organizations for the duration of the mission. He even finished on schedule and under budget!

Mr. Maxwell then explained the numerous preparations his team had to make to prepare the SSRMS for delivery. The first problem his team encountered was designing the tools and attachments to perfectly fit each other and the arm, working only from plans, since the actual arm was still with the Canadian Space Agency in Canada. The next problem they encountered was mysterious paint chipping. The team had used the approved paint and applied it correctly, but for some reason, it kept chipping. Eventually, contractors at Kennedy Space Center stripped the paint and reapplied it, and there were no more problems after that. The cause was never determined. Another issue the team faced was designing the system to be astronaut-friendly as well as effective. They came up with an ingenious way to store the bolts for the system. They also provided the astronauts with instructions, handrails, and foot supports, all of which worked very effectively.

The biggest problem Mr. Maxwell faced, however, was dealing with numerous different people with different ideas and different priorities. The customer proved to be very difficult, even demanding that Mr. Maxwell replace his chief engineer. He also changed the schedule and the requirements numerous times. Mr. Maxwell could always placate him, and the customer was highly satisfied at the end. This led to Mr. Maxwell's lessons learned, or as he called it, "lessons noted" section of his speech. His main conclusion was that the secret to being a good project manager was being able to get along with anybody. The mission would not have been a success if Mr. Maxwell had not been able to communicate effectively with the customer and the team. His final lesson was that if you can get people to do their jobs, and be happy about it, the project will be a success.

The Spec is Nothing, Specing is Everything!

By Florian Sehmer

If one thinks of a system as a precise and accurate product, systems engineering does not offer an option as far as specifications go--sooner or later precision needs to be added to the system. However, the issues are not *if* but *when* precision first appears, who provides it, and when it can be validated. Mr. David Gelperin of ClearSpecs Enterprises explained in his session how to make common understanding common, using clear and task-adequate specifications.

How do I know as project manager what is task-adequate and what is task-inadequate? Task-adequate means that consuming stakeholders (estimators, architects, developers, testers) can use the requirements information to perform their assigned tasks without having to cope with defects such as imprecision, incompleteness, or inconsistency in the information. Task-inadequate requirements lead to uncoordinated coping behavior by consuming stakeholders and inevitable misunderstandings.

In most cases, you will find that it is the programmer, the person least qualified to see a relation between specifications and the overall project goal, who is inserting the precision. Mistakes are inevitable but often go undetected until the system goes into production. As project manager, you can probably decide when and how precision is added to the system. This does not mean that precision needs to be added (and money needs to be spent) across the whole project. It is the untested areas that you worry about that need precision, not the elements that were tested in earlier projects. The value of precision is directly proportional to the difficulty of achieving precision in a project. In other words, if it is easy and quick to insert precision, precision is probably not needed at all. On the other hand, any project manager will come to appreciate the effort made to agree with stakeholders whose opinions about a particular function or definition varied initially.

The ClearSpecs solution offers a rich, integrated, and extensible framework of specification patterns, with the goal to provide "just enough" detail in "just the right" places to minimize the risk of critical misunderstandings. Misunderstandings caused through natural language result in ambiguity, incompleteness, and inconsistency. For example, a specification such as "The system should be fronted by an efficiently navigable, imaginatively designed, attractively laid out and secure web site that…" will almost definitely result in various misunderstandings. Natural language might have been precise and accurate enough for the writer of this requirement, but for others, it is not. So what does this mean? If the problem of defining specifications is the natural language, the solution is not necessarily natural language. ClearSpecs tackles this problem by translating the fuzzy terms of natural language into precise requirements using coding. A term like "potential customers," for example, can be broken down into various conditions.

potential customer =
bought-many-services OR
bought-services-A-and-B OR
bought-a-lot-of-service-C
bought-many-services =
total-invoiced-service-types > 5
bought-services-A-and-B =
invoiced-for-service-A AND invoiced-for-service-B
bought-a-lot-of-service-C =
invoiced-amount-for-service-C > $500,000.00

Derived conditions name collections of logical expressions joined by "ANDs" and "ORs." Such decomposition of vague terms into logical expressions allows the project manager to discuss specifications with the experts using their own terminology. This strategy allows problems to surface by disclosing more details, ultimately resulting in clear, accurate specifications that eliminate the risk of misunderstandings caused by natural language. Of course, it is justified to ask what the benefit of 25 to 50 percent more requirements specifications effort will be for the project. Higher savings in testing, increased manageability of a project, and higher customer satisfaction are just a few.

A Cost Effective PMB

By Leticia Maia Borio

Mr. Gary Humphreys of Humphreys and Associates presented a method to measure project performance that is based on Earned Value analysis.

Performance measurement is a result-oriented management approach that can adequately determine the cost and schedule status of a project. A Performance Measurement Baseline (PMB) has to be established by organizing, scheduling, and applying the proper resources to the work. This three-step iterative process needs to be reviewed throughout the life of the project. Also, the PMB must be established in a timely and cost-effective manner, and good baseline change control has to be developed so that project status will be reported as accurately as possible.

The establishment of a baseline starts by defining and organizing the work to be performed. A work breakdown structure (WBS), defined by Mr. Humphreys as "a product-oriented logical subdivision of hardware, software, services and facilities that make up the project," should be developed. The WBS must clearly state WHAT needs to be done to complete the project. Each lowest level of the WBS should have a Statement of Work (SOW). At this point, responsibility must be assigned and clearly defined. Having done these two steps, a Responsibility Assignment Matrix can be developed, connecting the WBS to the project organization and establishing control accounts. The final step is scheduling the work. The schedule should be driven by events that are critical to meeting the objective. Master, intermediate, and detailed schedules can be developed; however, in order to have an efficient PMB, these schedules must be integrated, facilitating vertical and horizontal traceability. Resources should be assigned to each task, so that costs can be derived, finalizing the baseline.

Having developed a well-defined performance measurement baseline, the project can be effectively monitored utilizing the Earned Value method and several "what if" analyses can be performed, providing project managers with a powerful tool to keep projects on track and forecast costs at completion.

Program Management Tool

By Natalya Hicks

Dr. David Maluf, Project Manager and Advanced Exploration Knowledge Network (AEN) Laboratory Lead at NASA Ames Research Center, presented and demonstrated the NASA *Program Management Tool* (PMT). He is the principal investigator of this management system that was created four years ago. It is currently in its third generation and is classified as a proactive business tool. At this time, the software is used across two out of four NASA-wide mission directorates.

The requirements for the tool were gathered from the actual practices of NASA program and project managers who would be using it. This allowed the incorporation of NASA standards, of specifically required reports and charts, and of elements of the overall culture of the organization. For instance, the fact that some managers were sensitive to the use of certain wording was considered in order to respect NASA culture. Also, managers' preference for viewing information graphically was taken into account. Training is provided for new users; however, since they are already familiar with the context and language, they tend to learn quickly.

PMT is a NASA-invented and owned technology. This web-enabled software tool has the same usability of earlier project management systems but with the added benefit of seamless integration of previously scattered information. This system is used primarily for monitoring, tracking, and disseminating information associated with the progress of research and development projects and programs. The tool is intended to be easy to use, to track accountability, and, ultimately, to improve communication between various NASA stakeholders.

Users do not have to be connected to the Internet to input data. This allows managers to use the system even when they are, for example, traveling on a plane. Dr. Maluf demonstrated its utility during the session by showing the work breakdown structure of a real NASA program and its associated milestones, GOTChA (goals, objectives, technical challenges, approaches), resources, deliverables, risks, and budgets. In particular, he demonstrated reporting and analysis functions that can assist with the standard rollup of budget and progress information from subprojects to higher level program elements. This process, which could take up to one month with traditional methods, is now done in real time with the PMT, and the output is almost immediate. When the "quad chart" is loaded, it even generates a complete set of presentation slides ready to use. The budget function also eases the data collection for a particular monthly briefing which previously required approximately two days to prepare. The PMT is connected to the software application SAP and allows instant access to SAP data. The tool also assists in earned value management analysis and reporting.

Dr. Maluf demonstrated that the PMT was created with the user in mind in order to assist with the challenges of managing complex networks of communication. This tool ensures that consistent, accurate, and up-to-date information on programs will be available and ready to share.

EVM Metrics

By Michael W. Durr

"What does $200,000 behind schedule mean?" This question posed by Mr. Harry Sparrow of Performance Management Associates, Inc., introduced a NASA audience to the increasing need to not only understand what EVM schedule metrics represent but how to translate it into meaningful schedule-affecting actions. His answer was, "It depends."

"It definitely means that you haven't completed as much work as you planned by now," but does it mean that the expected completion is in jeopardy? Does it indicate that additional resources or schedule-crashing is necessary to recover? Again, the answer is, "It depends."

Mr. Sparrow led the group in this workshop through several approaches to translating the Schedule Variance of a project into schedule terms versus cost terms by simply dividing the schedule variance by the average monthly Budgeted Cost of Work Scheduled (BCWS) and then illustrating the deficiencies of such an approach.

Early in his career, Mr. Sparrow was asked to explain a schedule variance to his upper management, and he could only answer in terms of dollars when the real question was, "Are we behind or will we finish on time?" Whatever approach is used should allow the project manager to answer those questions, and it points to the need to integrate the schedule and EVM metrics.

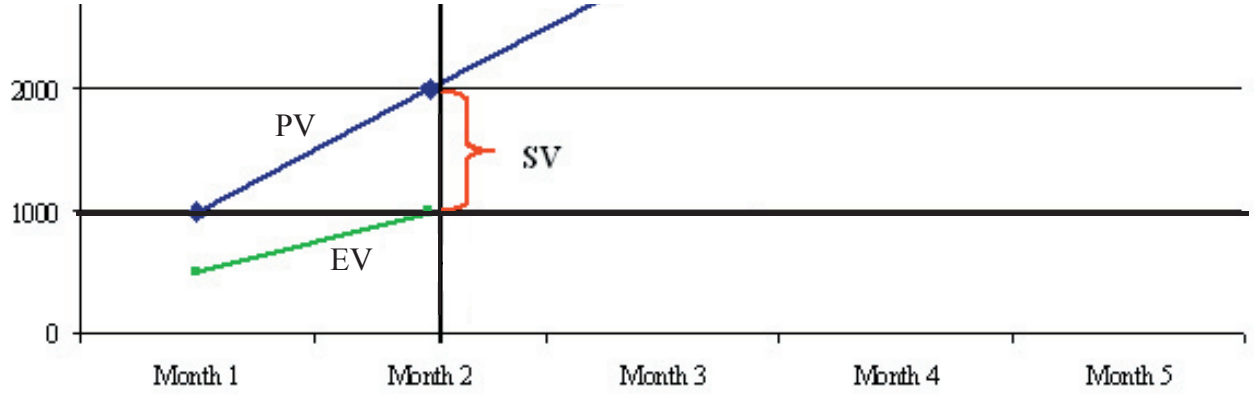
Schedule variance in earned value terms is the difference between work performed (BCWP) and work scheduled (BCWS). However, in schedule terms, it requires looking at critical path activities, float on non-critical activities, and the relationship of the items contributing to the variance.

"Without looking at the physical schedule, you won't know if you are behind or ahead," explained Mr. Sparrow. This becomes the key to ultimately understanding and integrating the schedule and EVM metrics. The example he used illustrated that the sample project had a rather sizeable schedule variance but when compared to the physical schedule, only two activities were behind that could possibly affect the completion date. These activities represented only a fraction of the variance and only one of those was seriously behind. Consequently, without this comparison, a great deal of effort and budget could have been expended in attempting to correct the complete variance when only a portion needed to be addressed.

Mr. Sparrow presented five schedule variance categories in order to identify those needing attention:

- "Problem"--Critical tasks that did not start on time.
- "Late with Float"--Tasks that did not start on time but are not critical.
- "Purposely Delayed"--Tasks delayed due to workarounds.
- "Early"--Tasks begun ahead of planned start.
- "Anomalies/Errors."

The need is first to understand the nature of the variances and then to move toward integrating the tracking mechanisms. The WBS forms the foundation of both the project baseline and the physical schedule. The WBS is used to establish the various "control accounts" that are used for the EVM metrics. The WBS is also linked to the activities of the physical schedule.



To have a truly integrated schedule, one must understand and link the relationships among the activities within a project's work packages. Decomposition of the work package is critical in identifying individual contributions to schedule variances. Consequently, the contribution of activities from the schedule to the Earned Value Management System (EVMS) and from the EVMS to the network logic and performance needs to be completed, correlated, and understood in order to explain and take action on improving the metrics and in ensuring project completion.

This interconnection, coupled with the synchronization of budgets and resources, results in true integration. If this occurs, "you can meaningfully compare your EVMS data to your schedule."

Mr. Sparrow concluded the presentation by posing the following question: "We all talk about the integration of cost and schedule. If we have achieved this, the EV and the scheduling information should correlate. How well is your organization doing this?"

Navigating the Communication Channels

By Florian Sehmer

Have you ever been involved with a project where communication was not an issue? If your project dealt with people outside your own team, it is unlikely. Often enough, vendors, solution providers, and even other subproject teams have their own way of doing business. Each of them might interpret management processes, the "encoding" and "decoding" of project-specific communication such as schedules and design, differently. Dr. Bob Noor of PMO Link, as well as Mr. Paul Zimmermann and Mr. Robert Martin of Entergy Corporation, helped to shed some light onto how project managers can navigate through this maze.

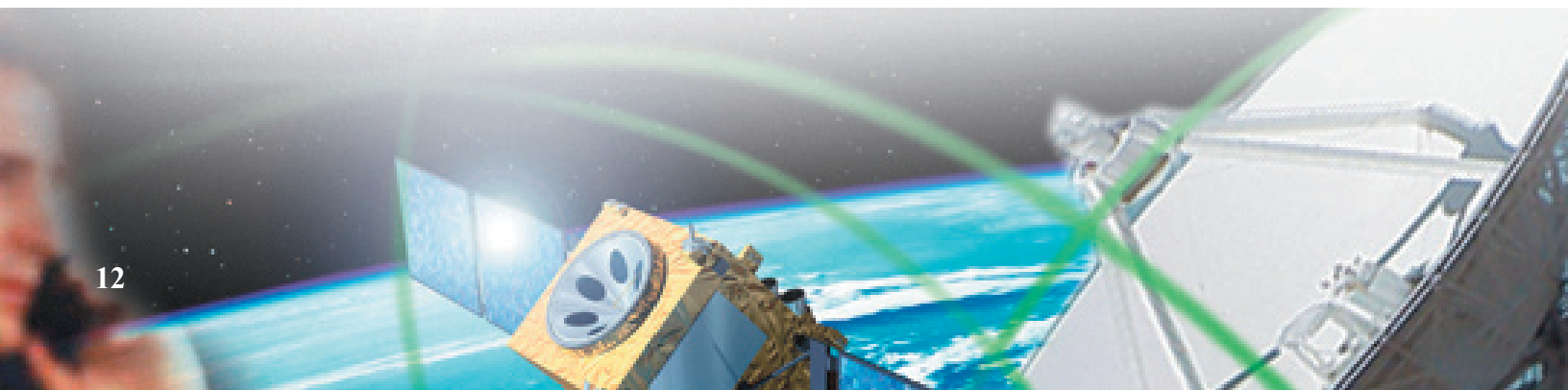
Failure to communicate takes various forms and, respectively, the challenges project managers face vary from situation to situation. Some of the most common mistakes made by project managers include uncontrolled project communication, failure to execute the communications plan, and inappropriately managing communication back channels. Many agree that some of these problems might have been prevented, or even predicted, had someone recognized them. Even if a communications plan was in place, were the right questions asked? Questions that should be addressed in the communications plan are: Who are the team members and what are their roles and responsibilities? Who needs communication and how often? What types of communication are needed?

A map only becomes useful if the readers know how to align and translate the map to their environment. North will only be north if readers of the map agree to it. But does it really matter which way is north when managing a project? People attending the session agreed that as long as everyone is marching in the right direction, it does not. A communications plan becomes useful only if the people who are reading it align to it and hence build some form of common orientation. Therefore, the key to understanding the plan is having everyone understand its foundation.

This, of course, presents another challenge for project managers. How do they make people in different functions with different responsibilities and backgrounds understand the same plan? A project manager's tools to level communication among the various parties include maps, schedules, status reports, drawings, and dashboards. Drawings may not mean anything to the executive sponsor or the finance person, but they do to the engineer. Directing updated communication to the target audience, therefore, becomes a main responsibility of any project manager.

Another important aspect to managing project communication is the need to detect possible miscommunication and misinformation and the problems associated with them. If the communication processes all seem to be running smoothly, then, most likely, they really aren't. It is inherent to human nature to avoid dealing with problems. However, problems do not take care of themselves, and if the engineer who makes a mistake in his plans does not come forward in time, the unreported problem might result in disaster. One cannot overly stress the importance of teambuilding when project managers face this challenge. Lunch and Learns, structured exercises, and incentives are all ways of removing unwanted barriers, building trust and confidence, and addressing people's fears of communication. But most importantly, teambuilding gives people ownership of the project. Ultimately, it is people who run the project, and a sense of ownership gives them a stake in the project, even if it is a small one.

Ninety percent of a project manager's effective time that is spent on communication may seem like a lot, but the time it costs to create a map, make sure everyone knows which way is north, and manage communication back channels makes this percentage appear small when compared to the consequences of neglecting communication.



"We Cannot Direct the Wind, but We Can Adjust the Sails"

Bertha Calloway

By Natalya Hicks

Dr. William Gerstenmaier, Program Manager of the International Space Station Program, spoke about the background of the Station, its role in the future, the history of the program, and the strategies used to manage it.

Sixteen countries are participating in the International Space Station (ISS), an example of continuous space operations. Even without the use of the Space Shuttle, the Space Station is operating 24 hours a day, seven days a week. There is a large organization behind the station, and Dr. Gerstenmaier credits his talented team across several NASA centers for making it work. The ISS is a multi-decade project that has spanned many years and many administrations. It currently weighs 400,000 pounds in space and will be 980,000 pounds when it is complete. Lots of assembly remain to be done, and hardware is ready and waiting in Florida for the next Shuttle launch. ISS management is debating the number and configuration of the final flights.

The ISS has been the most complicated assembly ever done in space, and it has become a prototype for future space exploration. It is a real-world test that will be studied for the future. Astronauts in space will install lighting on the Station that will also be appropriate for the Mars and Moon environments. The energy system and the propulsion system are also being tested with future uses in mind. Pumps are being built to exploration requirements. These aspects of the ISS are not highlighted in the press or even at NASA, Dr. Gerstenmaier said. However, they could serve as risk reducers for future exploration projects.

The program has changed over time, at times being scaled back and at other times becoming more complex. The original plan was very different from today's; however, the vision and mission statement have remained the same. This program has spanned both the *Challenger* and *Columbia* accidents and has been tested by congressional votes and dramatic redesigns. It was not originally created to be an international program but has turned into one that is based on bartered resources, not funds. In 1998, when the crew and lab were added, it was considered a phenomenal achievement. However, ISS management was highly criticized for what was perceived as high program costs and inefficiencies. The project was given cost caps and had to consolidate some contracts to become more efficient. Even though the assembly efforts signaled tremendous technical progress, members of the management team were surprised at the problems that came from the program and cost sides. Dr. Gerstenmaier explained that no one gives credit for being technically excellent but you are expected to be just as excellent in the areas of cost and business management.

When the *Columbia* accident occurred, the ISS project was not told that Shuttle flights would be grounded for such a long time. Dr. Gerstenmaier stressed the importance of being prepared with a strategy to keep a project going during long delays. The ISS project began planning as though the Shuttle would never fly again. It also had to contend with the extra costs of maintaining the flight hardware waiting for launch in Florida. Technicians have already had to change batteries due to the delay.

The strategic thinking for the program has changed as well. Prior to the 2001 Tom Young Commission that assessed ISS cost, budget, and management, the project was living from one fiscal year to the next and not considering overall program cost. Now Dr. Gerstenmaier considers multiyear and total costs, which has led to cost underruns for the program.

Six Sigma

By Michael Ford

Six Sigma is dedicated to achieving a sustained competitive advantage through continual improvement of all business systems in an organization. It is important to note here that continual does not necessarily mean constant but rather regularly over time.

Numerous companies in the private sector have implemented the Six Sigma program with outstanding results. Motorola, one of the pioneers of Six Sigma, has estimated savings of more than $15 billion in the past 11 years. Bechtel reported a nearly 700 percent return on a $30 million investment in implementing Six Sigma. Six Sigma can also result in non-monetary improvements such as improved customer satisfaction and improved development speed, among others. Because Six Sigma, at its root, is predicated on identifying and reducing variation, it could significantly benefit a high-reliability organization such as NASA.

Six Sigma integrates well with traditional risk management techniques because of its emphasis on reduction in variability. Incorporating risk management concepts into Six Sigma principles and training as well as aligning the tools and techniques commonly used in Six Sigma and risk management can significantly improve the chance of project success.

As evidence of this, Dr. Frank Anbari and Dr. Young Hoon Kwak, of George Washington University presented the results of a recent study they had conducted that included information on projects at more than 40 companies. Though all of the projects were either small or a subset of a larger project (both types running from 3-6 months), each had an expected savings of $100,000 to $500,000 – with the target savings being $175,000.

So how did the companies achieve this? They involved Six Sigma teams, from Yellow Belts up to Master Black Belts, applying Six Sigma practices to all phases of the projects. The organizations studied also noted some factors leading to the success of the Six Sigma initiatives. Chief among these were executive management commitment and organizational involvement as well as careful project selection and careful project management methodologies during implementation. Finally, a rigorous evaluation at project completion would lead to future improvements.

However, there are also several obstacles and challenges to watch out for when implementing Six Sigma projects. These include considering the organizational culture – making sure it is committed to the endeavor, selecting the correct person as the Black Belt – don't just choose someone because he is available, and education and training – making sure both the team and the organization get the training they need.

Six Sigma is not revolutionary; it is an evolution of past best practices in quality management and benefits from the work that has gone before. When used in conjunction with modern risk management techniques, it can lead to improved project performance, project management performance, and organizational performance.

Era of Transformation

By Leticia Maia Borio

Driven by new visions, missions, and needs for management improvement and reform, NASA is in the middle of a major transformation. Transformation enables the execution of new standards of success with high confidence and with less cost and risk. To meet the demands of its exploration vision, NASA is transforming many aspects of its operations. While project management must interact with a changing institutional infrastructure, the message is clear, project management's own improvement and transformation are critical.

Mr. Joseph Fuller Jr., of Futron Corporation presented an interesting approach that looks at risk management as a transformation agent. This approach can succeed by strategically managing risks and threats. All important decisions involve elements of risk and uncertainty; performing below standards on any management process creates risk. Risk tradeoffs yield optimal allocation of resources. Therefore, making high quality decisions is crucial. Mr. Fuller presented methods to help project managers make assertive decisions.

The first point defended by Mr. Fuller is that leaders must require risk-based information for all key decisions. Organizations must be committed to developing an Enterprise Risk Management capability by developing a systematic risk management process.
Systematic risk management is a process where risk identification considers the organizations' plans, processes, requirements, and costs; which is followed by a qualitative risk assessment. An integrated risk quantification must be developed, and risk handling and risk tracking and communication techniques must be implemented. Mr. Fuller emphasized that this process must be iterative so that new risks can be identified and analyzed effectively.

Projects can apply integrated, quantitative risk management methods to improve both their management practices and their technical and management decisions. These methods enable organizations to increase their overall project management performance by making high quality decisions.

International Project Management

By Leticia Maia Borio

The complexity of NASA's missions and the growing involvement of the international science community have required the Agency's expansion into the arena of international project management. Challenges, concerns, and advice related to this topic were discussed in this panel, composed of four senior NASA managers.

Communication is the main issue when dealing with international partners. In order to effectively build a team in a multicultural environment, all the panelists agreed and emphasized that language and cultural issues are areas that should be seriously considered. The impact of these factors, added to different laws and regulations in the projects, can be huge. Therefore, the importance of developing and maintaining a personal relationship is crucial. It builds trust, facilitating the decision-making process.

A well-defined scope, with low ambiguity in the requirements, is another factor that can make a difference when managing international projects. Making sure that a mutual understanding of the project's requirements was achieved in the initiation of the project, as well as setting expectations upfront, was pointed out by the panelists as an important challenge that can help avoid problems during the implementation phase.

The advice given reflects the challenges described above. Studying the culture and language is imperative, since it facilitates the establishment of personal relationships, creating collaborative and engaged teams. Recognizing the strengths and weaknesses of international partners is also important, as it helps in identifying the associated risks. This can be an issue unique to international projects, the panelists said.

Differences within and among countries and cultures are enormous and complex in international projects. Project managers need to accept these differences and treat them as real, or accept the consequences. The challenge is to get the project completed on time and on budget within a multicultural environment.

Panel Moderator:
Ms. Shanta Arur , NASA Goddard Space Flight Center
Panel Members:
Ms. Vicki Elsbernd, NASA Headquarters
Mr. David Leber, ITT
Ms. Jennifer Mason, NASA Johnson Space Center
Mr. George Morrow, NASA Goddard Space Flight Center

Unlocking Spiral Development

By Florian Sehmer

Traditionally, the development of new systems has been in an incremental, or waterfall, fashion--often inflexible, inefficient, and expensive. Though in existence for many years, spiral development is a management process that provides a way to incorporate new technologies and capabilities into systems more quickly than traditional approaches, bringing the entire system to operational readiness while still refining its capabilities along the way. With spiral development, risk is actively managed and reduced, and the system design is updated even as development continues.

One of the PM Challenge 2005 panel discussions addressed the notion of spiral development and evolutionary acquisition. The panel featured speakers with various backgrounds and perspectives on these concepts: Mr. John Karas of Lockheed Martin, Ms. Jennifer Walsmith of NSA, and Mr. Rick Obenschain and Mr. Richard McGinnis of NASA. The panel discussion was led by Mr. Walt Majerowicz of Computer Sciences Corporation. The following are highlights of the discussion.

Question: Spiral development is not a new concept, but can you explain what it is and how it is different from traditional development approaches?

Answer (Ms. Walsmith, NSA):

[…] It was introduced in the form of a formal acquisition contract in 1999. When they introduced that contract, what we were wrestling with in many respects was that our programs were large programs, were taking too long, and were costing too much. So we reached out to the aspect of evolutionary acquisition of which spiral development was one part. There are two aspects when we talk about evolutionary acquisition that you can choose from. The first is incremental, the second is spiral. […] What's the distinction between those two? We still have trouble with this, but fundamentally, what it means is if you are going to choose an incremental development approach within an evolutionary acquisition context, you know the end state. You know where you want to end up, but you are going to do it in a series of steps over time. The distinction in achieving spiral development within evolutionary acquisition is that you don't know the end state. You know only the first step that you want to take, but not the end state of the contract. […]

Question: Until the exploration initiative came along, NASA did not hear a lot about spiral development specifically, but from your experience and perspective, does it apply to the typical satellite project?

Answer (Mr. Obenschain, NASA, GSFC):

[...] For the most part, we know the fundamental technical questions we want to answer when we start development, but we're not really sure how to get there. So if we do a conventional development […] we tend to get to a certain point A and yet we need to move on to point B. […] To a large extent, where we end up to answer the question depends on what we learn along the way. We will actually come to a point where we will come up to the peak of achievability where we'll identify the next risk and we'll figure out how to mitigate that risk. So I see it as a journey, not necessarily as a roadmap. […]

Question: From the industry perspective and your experience […] it seems that there is a partnership needed between industry and government for spiral development to succeed. Could you comment on that point?

Answer (Mr. Karas, Lockheed Martin Corporation):

[…] From an industry standpoint, what spiral does for us for a development implementation is [that] we can adapt to the change in requirements. Now that doesn't mean the full end state of where you are going, […] but certainly liability and operational requirements [that] you can phase in, definitely risk management from several standpoints, risk management being technical risk management. If you wanted to go develop a brand new booster in ten to twelve years, you might want to go develop upper stage technologies […] in smaller increments, so you can manage the technical risk instead of three or four elements that combine and that give you more unknowns than you really want. It's also a schedule risk management tool, in the case of the commercial lift market; the market changes all the time [and] you're not really sure what the customer wants. So in some cases, it's developing

a product that's intermediary from a reliability standpoint or a performance standpoint. You can control schedule risk that way, you can control cost risk, because some of the end state elements require more development and more money. […] So you're controlling the risk of the program by cost, schedule, and technical. There are many aspects to what spiral development allows you to do. […] [Regarding the partnership between industry and government, it really does take a different cultural perspective. Instead of developing requirements for a product and fielding a product and doing it again and again, there's a certain amount of synergy that has to be done--some carryover, some commonality to save money, or you're doing it over and over again. Working with a customer that understands that is very valuable. […]

Question: When we look at what are called the overarching principles for the Exploration Directorate, one of these is spiral transformation. […] Could you comment on this from your perspective? What is the Exploration Mission Directorate's view, to help the rest of NASA understand this concept?

Answer (Mr. McGinnis, NASA):

[…] What we are looking at in Exploration Systems is defining spirals that can be defined as major increments […] of capabilities that we need to deliver. The first one is the capability that we need to have to meet the President's first milestone for us in 2014 of having our CEV [Crew Exploration Vehicle] successful flight. The second spiral from an Exploration Systems perspective is going back to the moon. The third spiral is going to the moon for prolonged stays. The fourth one is to going in the vicinity of Mars, with the fifth one being able to finally put people on Mars. So we know what they are in a sense of now. We are going to go through a classic waterfall development with all the standard reviews that we all know and love and find, hopefully, successful. But we intend to not define the future spirals until we have learned things and what we are doing in the ones that we are doing now or the ones we have completed. […] The intent is to not add the requirements all upfront[…]

Question: Is there a cost to spiral development or does it pay for itself?

Answer (Mr. Karas, Lockheed Martin Corporation):

[…] There are several versions of cost. If you talk about cost in terms of total development dollars, it will probably cost you more overall, but it shouldn't cost you a lot more. In relation to developing more products it should be cheaper. […] The cost of risk reduction is very large. If you do it right and you have a long string of successes, it saves you money in the long-term. So it really does help and if along the way you fail [to develop] a certain product, you still have a base and products that are alive in the market. The other cost is hard to measure as it's not in terms of money, but in terms of people. If you do it right, you have a sustained period of development. You have trained and sustained a workforce that is steep in development. They understand operations, requirements, and development, but they are steep in development. That is going to be very critical and key to the Space Exploration Initiative as we go do that. […] All in all, [spiral development] saves you money. It doesn't generate money, but it saves you money.

Feedback from participants at PM Challenge 2005 raised some interesting questions and comments about spiral development at NASA including: "How can I find out more about spiral development?" "Where can I go for training?" "Can Exploration Systems give us an update at next year's conference" and "We need to hear more about topics and initiatives like spiral development at NASA." Panel discussions like those at the PM Challenge conference are one way to continue this dialogue among NASA stakeholders about important ideas such as spiral development.

Panel Moderator:
Mr. Walt Majerowicz - Computer Sciences Corporation
Panel Members:
Mr. John Karas - Lockheed Martin Corporation
Mr. Richard McGinnis - NASA Headquarters
Ms. Jennifer Walsmith - National Security Agency
Mr. Rick Obenschain - NASA Goddard Space Flight Center

Project Management Roundtable

By Emily Whitted

Today's project managers have a number of common problems. It is difficult to meet cost, schedule, and performance goals. There is the problem of coming up with an accurate picture of projected project outcome. Project managers also face the pressure to tell a good story. To further complicate matters, NASA is becoming more focused on process. This panel of senior NASA talent addressed these concerns and issues raised by the audience.

The audience raised a question on the value of experience versus project management "book smarts." The panelists agreed that a gradual growth in responsibility is invaluable, and that the lessons learned through these experiences, both good and bad, enhance a project manager's ability to be successful. In the area of process, though, panel members initially disagreed. One panel member stated that project management is not a cake recipe. He emphasized that one cannot just follow an outlined list of steps to success. Another panel member, however, was actually shocked at the lack of structure in project management. The panelists quickly built a bridge between their different opinions. Project management could be viewed as a cake recipe to achieve project success. It should not, however, be viewed as a bible. A cake recipe allows for adjustments to accommodate change. One can add a little or take away a little to achieve the desired results. A good cook (project manager) can exercise flexibility to achieve project success. Similarly, processes can be positive if used as a guide and applied with flexibility.

All panel members agreed that mentoring is very important to building a foundation for strong project management. One panel member described it as the most motivating factor as it provides a project manager with the opportunity to learn from both good and bad experiences without being judged. Another panelist reflected that he has always had someone to go to who would just listen.

Project managers at NASA are faced with tough decision making, and the competition for funding builds barriers to team collaboration because it introduces the thorny area of politics into the process. These complexities can be overcome by focusing on the important aspects of managing a project. Focus should be on staffing the project with the right people, strong systems engineering, and a project manager who doesn't think of issues in terms of black and while but who can think "gray." Flexibility can exist on projects, but there needs to be a cutoff point for changes. Strong emphasis should be placed on problem definition happening sooner than later. Project managers must hold themselves accountable by stepping up to the plate and taking responsibility.

Team dynamics are important. Keeping the team happy is crucial to strong collaboration. Team members who cannot get along should be reassigned. Collocation was highlighted as the key to strong team collaboration as well, especially in the case of scientists and engineers. Because scientists and engineers often speak different languages, the benefits of collocation are heightened. Collocation can be costly, but in some circumstances, the benefits far outweigh the costs.

There were many great moments in the discussion. For example when the panel was asked what they would change about running projects, their answers were: reduce uncertainty in requirements, establish a clear definition of project managers' roles and responsibilities, and increase management's trust in the ability of project managers to perform their job.

In closing, it was nice to see that, while NASA faces unique opportunities for change, the answers these project managers gave were those that all project managers, both inside and external to NASA, could appreciate.

Panel Moderator:
Ms. Vickie Moran - NASA Goddard Space Flight Center
Panel Members:
Mr. Nicholas Chrissotimos - NASA Goddard Space Flight Center
Mr. Tony Comberiate - NASA Goddard Space Flight Center
Mr. John Herrin - NASA Langley Research Center
Mr. Dennis McCarthy - Swales Aerospace

Project Management Training

By Michael W. Durr

"Developing project management practitioners historically has been isolated to the organization in which the project manager resided. Developing the project manager from 'cradle to grave' is no longer viable as the broader pool of four and five years ago has grown increasingly smaller." So said Mr. Tony Maturo of NASA in capturing the look ahead for project management training at NASA's Project Management Challenge on the 23rd of March. Mr. Maturo was part of a panel discussion addressing the challenges and opportunities facing the project managers of the future.

The panel also concluded that project managers "need to be more business oriented in today's environment" than the conventional "technically solid" orientation of the past. Dr. Frank Anbari of George Washington University added that we also need to "expedite the learning cycle" by "capturing lessons learned and best practices used" and then "transferring that experience" across the Agency.

The skills forecasted to be critical to success are leadership, communication, and the ability to work in cross-cultural teams with strong emphasis on the "so-called soft skills" including conflict management, negotiating, and motivational skills.

The discussions prompted by questions from the NASA audience covered topics ranging from certification, training delivery, and the increasing need for strong communication and leadership skills.

Dr. Anbari captured the panel's feelings effectively when he said, "The most powerful wave in business today is project management." Dr. Maya of USC expanded this by identifying four trends in project management training that are being driven by this wave:

• Distance Education—where training is available anytime and almost anywhere.
• Systems Competency—where there is a trend toward a "systems approach" that is related to the technology.
• A "Radical" Project Management Component—where quality and risk co-reside and become inherent to the planning.
• Standardization—where the PMBOK (Project Management Body of Knowledge) is becoming the "de-facto standard," even in organizations such as the Department of Defense and NASA, where there are differences, but where the organizations are still focusing on standards.

The rapid acceleration of growth in innovation, technology, tools, etc., continues to dictate the need for more and more projects to accomplish the work. However, as more projects expand across organizations, the number of project failures grows proportionally. The most important need is to bridge and close the distance between project success and project failure. This is, or should be the role of training.
When asked "what future things should be emphasized in the next five years?" the panel identified the need for more emphasis on the following:

• Partnering—"we are in competition internationally and are part of an international community that competes and collaborates."
• Certification—providing not only standards but a resulting "confidence" in performing.
• External collaboration—within the NASA community.
• Formalized experiential training—where the best practices within NASA and the international community become part of the day-to-day culture.
• People-focused skills—communication and the focus on people, "promote people and people values."
• Receptivity to change—more than ever, "we need to be receptive to change."

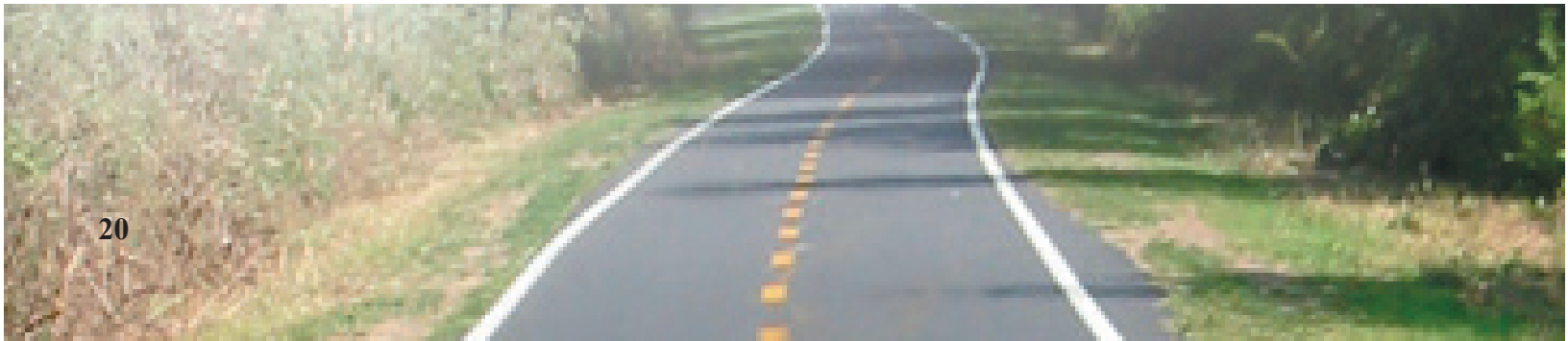
Historically, the process at NASA has been apprentice to journeyman to master, but today's model is mentorship to networking to peer. Thus, how do we answer the last question posed to the panel, "How do we infuse mentoring into the culture?"

The panel agreed that these steps are the keys to success:

• We need an external effort to match mentors and protégés.
• Individuals need to take the lead by selecting and soliciting their own mentors.
• As project managers, we need to "prepare our own replacement."
• It is wise to identify those who are where we want to be and emulate their successes.

Mr. Maturo captured the essence of the discussion when he said, "'One NASA' is not just a phrase. We must maximize our effort toward successful mission completion by knowledge-sharing in practice and in leadership."

Panel Moderator:
Mr. Jahi Wartts - NASA Goddard Space Flight Center
Panel Members:
Dr. Frank Anbari - George Washington University
Mr. Tony Kim - NASA Marshall Space Flight Center
Mr. Tony Maturo - NASA Headquarters
Dr. Isaac Maya - University of Southern California
Mr. Bob Menard - NASA Headquarters



What's On the Horizon

By Natalya Hicks

The *On the Horizon* panel highlighted tools and processes being developed and implemented across NASA.

Goddard created "Rules for the Design, Development, Verification, and Operation of Flight Systems", the Center's highest-level technical design standard document for flight projects. Warren Connley, Risk Manager, Office of Mission Success, NASA Goddard Space Flight Center explained that GSFC wanted to improve its processes by institutionalizing standards that have proved successful in the past. This document facilitates information-sharing across the Center, setting out design principles, the rationales for following them, and presenting their associated risk indicators throughout the project lifecycle. This web-accessible document, which is continually updated, links lessons learned, case studies, and other applicable references to each principle. Mr. Connley feels that the PM Challenge is a good forum for building on the systems and ideas of other centers.

Ms. Kelly Looney, Manager of the POLARIS Project, discussed its implementation at NASA's Marshall Space Flight Center and the Jet Propulsion Laboratory. POLARIS is an online library and resource information system that supports program/project managers and their teams. Support information of potential benefit to program/project managers, such as requirements and lifecycle diagrams, will be included in this system, which is now in the prototype stage. Key processes used by program/project managers will also be on the website with associated requirements, tools, products, training, etc. The prototype website is now complete and is being tested. In 2007, the system will be available for everyone's use, and Ms. Looney hopes that it will be used in APPL Program/Project Management training. Ms. Looney invited experienced project managers to get involved.

The Jet Propulsion Laboratory had some failures a few years ago that encouraged it to improve its processes. Mr. Jeff Leising, Manager, Project Planning Office, NASA Jet Propulsion Laboratory explained that the decision to improve JPL processes resulted in the creation of a project management class, a Project Support Office, and sets of design rules and project management practices. JPL's mandatory offsite project management class lasts one week and focuses on rules and lessons learned. The Project Support Office was created to provide human help for projects. Office staff members assign representatives to every Phase A and Phase B project and assist in getting the projects off to a fast and efficient start. Mr. Leising explained that they spoke one-on-one to the projects about the Project Support Office, presented to project management classes, and posted information on their website.

Marshall Space Flight Center also experienced problems with project cancellations or failures, which led to the idea of formal development of project managers. Mr. Steve Newton, Senior Systems Engineer, Systems Management Office, NASA Marshall Space Flight Center explained that Marshall developed its project management development and certification by looking at APPL's Program/Project Management Development Process (PMDP). Marshall chose the PMPD process since all NASA centers recognize this certification. Marshall mandated that everyone be certified within three years in order to be considered for any future Marshall program or project management position. Although there were some initial questions, most employees embraced this directive. Budget cuts have not allowed the program to remain mandatory, but the certification board is up and running, and there are certified project managers. Mr. Newton described the pride that employees have after receiving certification recognition.

Panel Moderator:
Mr. Howard Kea - NASA Goddard Space Flight Center
Panel Members:
Mr. Warren Connley - NASA Goddard Space Flight Center
Mr. Jeff Leising - NASA Jet Propulsion Laboratory
Ms. Kelly Looney - NASA Marshall Space Flight Center
Mr. Steve Newton - NASA Marshall Space Flight Center

Key To Contract Performance

By Emily Whitted

The conclusion of this panel discussion is that team integration and communication, built on trust, are key to contract performance. The discussions ranged from the team's responsibility to establish partnerships to individual performance from both the project manager and the customer. Several key points came out of the discussion.

Keeping procurement informed and making it part of the team are crucial to project success. Procurement is not there to preach the Federal Acquisition Regulation (FAR); they are there to work cohesively within the team in spite of the FAR. From a contractor's perspective, no one wants to violate the FAR. Instead, all parties want to develop a partnership within the team early as a proactive way of learning what is right and wrong. Strong communication is a by-product of the process.

Continuing with the procurement role on projects, one of the questions from the audience related to performance-based contracts (PBCs) and whether they build a bridge or drive a wedge in establishing a partnership between the government customer and the contractor. It appears that these types of contracts are actually part of an evolutionary change in culture. Used properly, PBCs act as vehicles for facilitating communication. The contracts set up the mechanism for establishing a partnership by enhancing open dialogue and managing contractor behavior. Because PBCs get so much attention, they have actually forced a partnership and not driven a wedge between the customer and the contractor.

Trust in communication plays a key role in dealing with the difficulties that arise when there is a negative situation on a project. With NASA, these situations are heightened by the press. The government-contractor team can proactively counteract negative press through aggressive communication, detailed failure analysis, a developed and executed plan to address the situation, and communicating a status plan to the customer. Because there is a contract, both the government customer and the contractor share the responsibility. Both parties want to recover. The team culture should allow contractors to come forward to divulge what is happening early without feeling threatened by the customer. Even in failure, with a strong government-contractor partnership, the path to failure is recognized sooner, and actions can be taken to minimize risk and the impacts associated with these risks. In turn, the government customer needs to trust the contractor because the overall objective should be to establish a partnership. This process could be lengthy, but the payoff is a higher level of team performance.

Part of communicating information is becoming familiar with the key contacts on the project. In other words, "with

whom should you be communicating?" The sooner a project manager establishes key points of contact, the better. In fact, if at all possible, it should be done before accepting the position. The new project manager should establish a list of "meets and greets"and build on the list as the project moves forward. Opportunities for improvement exist in establishing key points of contact and knowing where to go for help. The project manager should find out what is working well on the project, but most importantly, recognize what is not working well. They should take steps to identify the gaps and implement change. Building this kind of partnership goes beyond just getting the job done. The customer is more receptive to bad news if they feel the appropriate amount of rigor was applied to keep them informed.

Understanding customer expectations is crucial to the customer's perception of project success. As noted by one panel member, "his only job is to keep the customer pleased." Different ways of information-gathering were discussed. They ranged from surveys to audit teams. Each of the methods can provide unique findings not found in day-to-day team communication, but a balance in gathering this material must be met. In order to keep the customer happy, no method of gathering feedback should be done at the customer's expense.

Finally, collocation of team members increases team communication in immeasurable ways. One panel member requires collocation on all of his projects where possible. It removes the paper pushing mentality and allows team members to capture the knowledge that is not written on paper. Collocation was referred to by one panel member as allowing team members to gather the information that was in the "white space," undocumented bits of knowledge that contribute to project success. This additional insight into project issues allows the team to act proactively by motivating it to attack problems.

Ultimately, the soft skills necessary for communication and management's recognition of these skills will provide the necessary environment for culture change. All team members, both government and contractor, will have to proactively manage expectations by openly communicating both good news and bad news. Management will have to keep a line of communication open to inform teams of the missions, goals, and objectives that will allow project teams to get the job done.

Panel Moderator:
Mr. Dwight Norwood - SGT, Inc.
Panel Members:
Ms. Donna Fortunat - National Science Foundation
Mr. Bob Frick - Perot Government Systems
Ms. Gigi Hackford - NASA Stennis Space Center
Mr. Todd Probert - Honeywell

A Personal Perspective

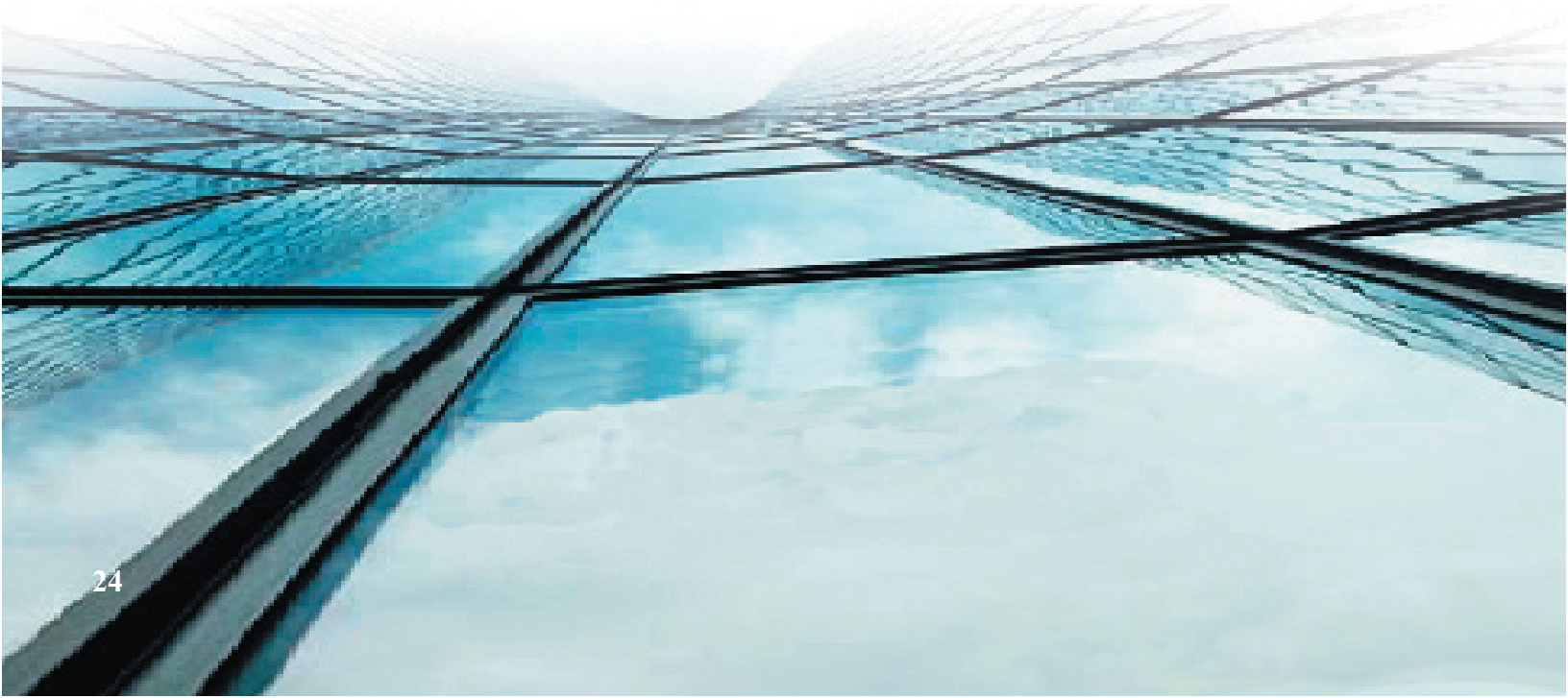
By Steve Schneider,
Computer Sciences Corporation

The Goddard Space Flight Center, hosted the second annual NASA Project Management Challenge under the direction of the conference co-chairs, Dorothy Tiffany and Walt Majerowicz. I was fortunate to have the opportunity to participate as a Track Coordinator at the conference, which afforded a unique inside perspective to the many demands levied on those who made this event so noteworthy. What is particularly commendable is the dedication and enthusiasm displayed by the countless volunteers who gave their time, talent, and energy to this memorable event. It was their dedication, professionalism and teamwork that made this conference a phenomenal success.

The University of Maryland Inn and Conference Center was abuzz with activity as aerospace industry leaders, NASA representatives, and associates from around the world participated in leadership panel discussions, project management seminars, and a general "meeting of the minds" in the spirit of sharing innovative ideas and solutions for today's project management concerns. "Earned Value Management," "SAP Implementation," "Scheduling Risk Assessments," to name a few, were the topics explored and dissected by the 800 conference participants. Experts in science, engineering, technology, communication, and a host of other disciplines were on hand to share their experience, expertise, and knowledge regarding viable solutions for project management issues.

For example, Dr. David Ullman, president of Robust Decisions Inc., emeritus professor of Mechanical Engineering Design at Oregon State University, and author of "Mechanical Design Process," conducted a seminar on "Improving Project Cost Estimates." The seminar explored the difficulties associated with estimating costs for new projects and the problems that contribute to cost overruns. At first glance, it would appear the seminar would require at least two full days to examine the details of such a complicated issue. But Dr. Ullman, utilizing his teaching acumen and his expertise in cost estimating, relayed his understanding of a more accurate approach to estimating costs for projects in an hour. The participants left the seminar with a clearer understanding of the problems associated with cost estimating and possible solutions for this project management dilemma.

This is just one of the many examples of the professional seminars presented at NASA Project Management Challenge 2005. I personally found it to be a rewarding experience and learned a great deal more than I ever anticipated in the two days of this conference. I would recommend it to anyone who is interested in learning more about NASA mission projects and the various professionals and disciplines that make NASA project management successful.



PM Challenge 2006: "Putting Ideas into Action"

We hope that you have enjoyed this first edition of PM Perspectives. This look back at PM Challenge 2005 featured a summary of the many new and exciting ideas presented at the conference. While new ideas are a key ingredient to an organization's success, so are the people who have to put those ideas into action. The right people and the right ideas make up that "right stuff" so vital for continuous improvement in program and project management to take root and help the agency grow and successfully achieve its missions and objectives.

"Putting Ideas into Action" is the theme for PM Challenge 2006, and also the challenge to NASA program and project management practitioners as we move ahead. The coming months are sure to be exciting ones for the agency as new leadership, transformation, return of the space shuttle to flight, advances in Earth and space science, the Exploration Vision and other initiatives unfold. Program and project management will continue to play an essential role in these and other areas.

Please join us in Galveston, Texas, for PM Challenge 2006 next March 21-22. Check our conference website, http://pmchallenge.gsfc.nasa.gov later this summer for more information about the conference. Our call for participation will describe more about our tracks, topics and speakers. Meanwhile, think about new ideas in program and project management and how to put them into action to further enhance mission success at NASA. Whether you are a conference attendee, speaker, panelist or exhibitor, your contributions and participation in the PM Challenge conferences are valued and greatly appreciated. See you next March!

Dorothy Tiffany / Walt Majerowicz
PM Challenge Co-Chairs

MOODY GARDENS
GALVESTON ISLAND

NASA Project Management Challenge 2006